Trend Study 23-3-03

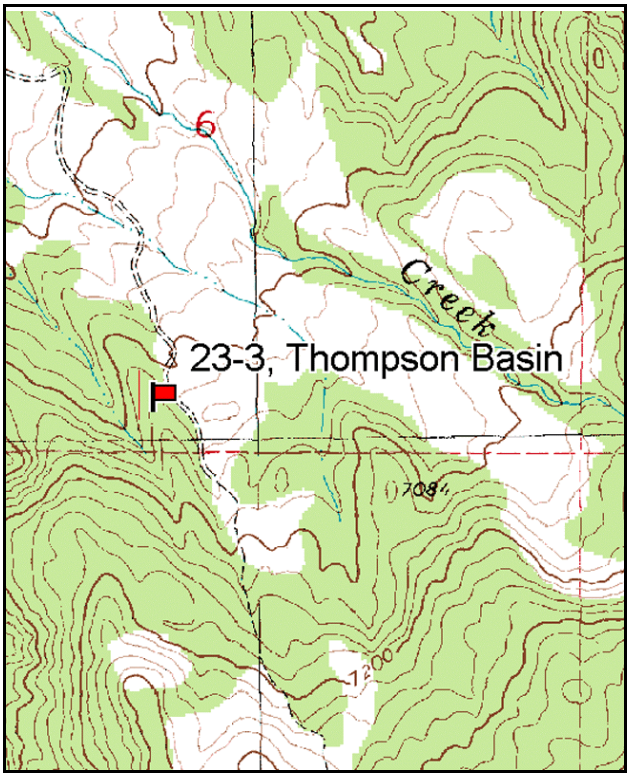
Study site name: Thompson Basin . Vegetation type: Juniper-Pinyon .

Compass bearing: frequency baseline 180 degrees magnetic. (Lines 2 & 3 155°M)

Frequency belt placement: line 1 (11 & 95ft), line 2 (34 & 71ft), line 3 (59ft). No rebar.

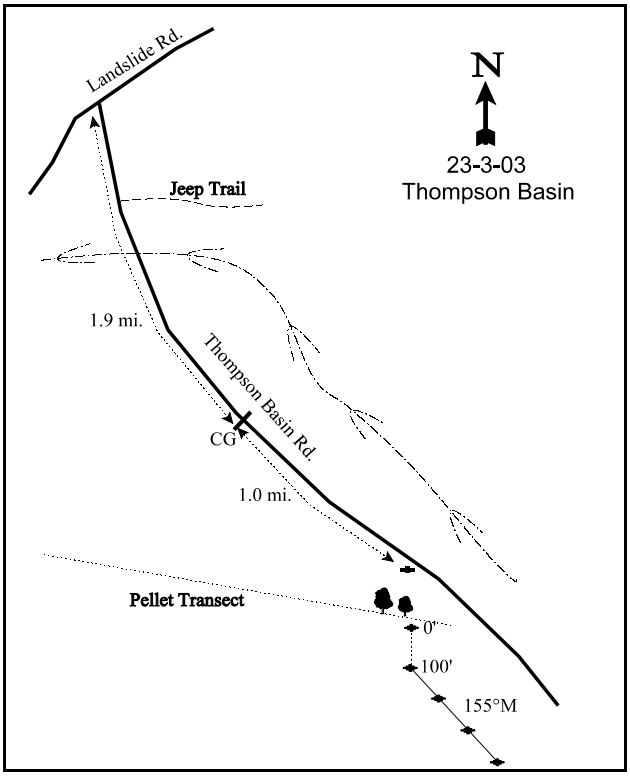
LOCATION DESCRIPTION

From the Monroe City cemetery, go 3.05 miles north and east to a gravel road on the right. Turn here and go 1.0 miles to the Thompson Basin Road. Turn right and proceed 1.9 miles to a cattleguard. Continue 1.0 mile up the road and stop. There is a witness post on the right side of the road. Fifty feet up the hill, there should be a juniper with the center trunk cut out. The 0-foot baseline stake is on the other side of this tree, approximately 60 feet from the road. The 0-foot stake is a 3/4" rebar tagged #7041.



Map Name: Monroe

Township 25S , Range 2W , Section 6



Diagrammatic Sketch

GPS: NAD 27, UTM 12S 4279063 N, 407808 E

DISCUSSION

Thompson Basin - Trend Study No. 23-3

This trend study is located on a moderately steep (25%) juniper covered slope above Thompson Basin. The study is at an elevation of 6,800 feet with a northeast aspect. An area below the transect was chained about 20 years ago by the Forest Service. A fire has also gone through the area approximately 25 years ago. Thompson Basin has been noted historically as a concentration area for deer during the winter. Deer pellet groups are frequently encountered. A DWR pellet group transect, which intersects the trend study, indicated a 5 year average of 32 deer days use/acre (80 ddu/ha) between 1980 and 1985 (Jense et al. 1985). The 6 year average from 1986 to 1991 was only 9 deer days use/acre (21 ddu/ha) (Jense et al. 1991). A pellet group transect read in association with the vegetative transect in 1998 estimated 21 deer days use/acre (52 ddu/ha) and 12 elk days use/acre (30 edu/ha). Data from 2003 estimated 26 deer and 9 elk days use/acre (65 ddu/ha and 23 edu/ha). The site provides good thermal cover but little forage for wintering big game. In the past, the slopes were heavily grazed by both sheep and deer. However, the Forest Service has now closed the area to livestock grazing to protect watershed values.

Ground cover is dominated by large rocks and pavement. Soil texture is a sandy clay loam that is neutral in reactivity (pH 6.6). Effective rooting depth is estimated at 13 inches. Soil temperature is relatively high for a site at this elevation and aspect, averaging 75° F at 10 to 14 inches in depth in 1998 and 2003. The steep slope has a moderate to severe erosion potential. The cover provided by the bunch grasses and the low amount of bare soil helps keep erosion to a minimum. However, there are a few large active gullies on the hillside and in the valley.

The dominant overstory is a mixture of mature juniper and pinyon. The older junipers show evidence of high-lining, but the younger trees do not show this characteristic yet. All are vigorous. There was a high proportion of seedlings and young in the population when it was first read in 1985. Point-center quarter data from 1998 estimated 99 juniper trees/acre and 72 pinyon trees/acre. Average diameter of juniper was almost 10 inches, while pinyon averaged only about 4 inches indicating the invasion of pinyon into the juniper. Overhead canopy cover for juniper and pinyon was estimated at 23% in 1998 and 34% in 2003. This amount of canopy cover will decrease productivity of the understory. Tree density remained similar in 2003, at 97 juniper trees/acre and 63 pinyon trees/acre. Average diameter of juniper was estimated at 8 inches while pinyon averaged 5 inches.

Mountain big sagebrush is the principal key browse species. It had a relatively low density of only 1,000 plants/acre in 1998 and 2003. In 1985, the sagebrush appeared vigorous and seemed to be recovering from heavy browsing pressure of the past, especially the hard winter's of 1982-84. The mature plants showed light to moderate use of the current year's growth. The majority of the plants were classified as mature and decadent. No seedlings were encountered in 1985 or 1991. Percent decadence peaked at 55% in 1991, declining to 30% by 1998. This is still moderately high for a healthy sagebrush population. By 2003, the number of decadent plants increased upward again to 42% and the number of shrubs displaying poor vigor also increased from 10% to 24%. It appears that the trend for sagebrush is slowly declining due to competition with the juniper and pinyon overstory in conjunction with drought.

Grasses are fairly abundant in the interspaces. Mutton and Sandberg bluegrass’s are the most abundant, followed by bluebunch wheatgrass and bottlebrush squirreltail. The grasses provide important ground cover, some winter forage, and are valuable in spring as early green forage. Forbs are sparse, with the more common species being desert and longleaf phlox.

1985 APPARENT TREND ASSESSMENT

There is some soil movement and erosion from the hillside, but the grass and sagebrush cover aides in infiltration and stabilizes the slope. The slow increase in the density of pinyons and junipers threatens the understory plants and increases erosion potential. The character of the soil and steepness of the slope make chaining very difficult. However, firewood cutting could be encouraged to maintain open canopy in this area.

1991 TREND ASSESSMENT

The soil trend appears to be slightly down, with percent bare ground increasing from 11% up to almost 20%. Most sites have shown this same pattern with the extended drought (1986-1990). The numerous large rocks setting on the soil surface indicate that there has been considerable soil loss in the past. This should be monitored closely because of the steepness of the slope. Mountain big sagebrush has declined slightly in density in conjunction with an increase in percent decadency from 33% to 55%. The percentage of plants that are heavily hedged and classified with poor vigor have also increased. Low rabbitbrush has not increased in numbers since the last inventory. The trend for browse is down slightly. The herbaceous understory has improved, with almost all nested frequency values for both grasses and forbs increasing.

TREND ASSESSMENT
soil - down slightly (2)
browse - down slightly (2)
herbaceous understory - up (5)

1998 TREND ASSESSMENT

The trend for soil is stable with percent bare soil decreasing to about 8%. Rock and pavement cover has remained high at almost 57%. Mountain big sagebrush density has declined slightly along with a large number of dead plants being sampled. Percent decadence has decreased, but it is still relatively high at 30%. Trend for the key browse is down slightly because seedling and young recruitment is still fairly low. Trend for the herbaceous understory is down due to a decline in the sum of nested frequency values for both the grasses and forbs. Nested frequency of the dominant perennial grasses, bluebunch wheatgrass, mutton and Sandberg bluegrass, all declined significantly.

TREND ASSESSMENT
soil - stable (3)
browse - down slightly (2)
herbaceous understory - down (1)

2003 TREND ASSESSMENT

Trend for soil is down slightly due to an increase in percent bare ground and a decline in vegetation and litter cover. Erosion is not a problem yet. The erosion condition class was determined to be stable in 2003. Trend for mountain big sagebrush is down slightly. Density has remained stable but the number of decadent plants increased to 42% of the population. In addition, 57% of the decadent plants sampled were classified as dying (>50% of crown dead). Young recruitment has improved slightly, yet it is not adequate to maintain the stand if current precipitation trends continue. Competition with pinyon and juniper trees is also a major factor. Canopy cover (line-intercept) of these trees was estimated at 34% in 2003. Trend for the herbaceous understory is stable. Sum of nested frequency for perennial grasses declined slightly, while frequency of perennial forbs increased slightly. Total herbaceous production is poor averaging only 13% cover in 1998 and 8% in 2003.

TREND ASSESSMENT
soil - down slightly (2)
browse - down slightly (2)
herbaceous understory - stable (3)

HERBACEOUS TRENDS --
Management unit 23 , Study no: 3

Type	Species	Nested Frequency				Average Cover %	
		'85	'91	'98	'03	'98	'03
G	Agropyron spicatum	$_{a}$41	$_{c}$203	$_{b}$124	$_{b}$151	4.71	2.65
G	Bromus tectorum (a)	-	-	36	44	.19	.18
G	Oryzopsis hymenoides	-	-	-	2	-	.03
G	Poa fendleriana	$_{b}$41	$_{c}$128	$_{d}$162	$_{a}$7	6.05	.04
G	Poa secunda	$_{a}$17	$_{c}$138	$_{b}$85	$_{c}$148	1.00	2.59
G	Sitanion hystrix	$_{a}$4	$_{b}$43	$_{a}$1	$_{a}$1	.00	.00
Total for Annual Grasses		0	0	36	44	0.18	0.18
Total for Perennial Grasses		103	512	372	309	11.77	5.31
Total for Grasses		103	512	408	353	11.96	5.50
F	Antennaria rosea	1	3	-	-	-	-
F	Arabis spp.	$_{a}$-	$_{b}$17	$_{ab}$8	$_{ab}$11	.02	.07
F	Castilleja chromosa	-	8	-	-	-	-
F	Collinsia parviflora (a)	-	-	$_{a}$-	$_{b}$51	-	.21
F	Crepis acuminata	-	5	-	-	-	-
F	Descurainia pinnata (a)	-	-	$_{a}$-	$_{b}$92	-	.75
F	Draba spp. (a)	-	-	-	5	-	.02
F	Erigeron eatonii	-	3	3	-	.00	-
F	Erigeron pumilus	3	6	-	-	-	-
F	Eriogonum racemosum	3	1	3	-	.03	-
F	Gilia spp. (a)	-	-	-	1	-	.00
F	Holosteum umbellatum (a)	-	-	$_{a}$-	$_{b}$14	-	.03
F	Machaeranthera canescens	5	-	-	-	-	-
F	Phlox austromontana	$_{a}$12	$_{b}$52	$_{b}$56	$_{b}$63	1.24	1.70
F	Phlox longifolia	$_{a}$-	$_{c}$59	$_{a}$3	$_{ab}$15	.01	.07
F	Streptanthus cordatus	-	-	1	1	.00	.00
Total for Annual Forbs		0	0	0	163	0	1.02
Total for Perennial Forbs		24	154	74	90	1.31	1.84
Total for Forbs		24	154	74	253	1.31	2.87

Values with different subscript letters are significantly different at alpha = 0.10

BROWSE TRENDS --
Management unit 23 , Study no: 3

Type	Species	Strip Frequency		Average Cover %	
		'98	'03	'98	'03
B	Artemisia tridentata vaseyana	40	35	4.21	4.77
B	Chrysothamnus viscidiflorus stenophyllus	0	0	-	.00
B	Gutierrezia sarothrae	0	1	-	-
B	Juniperus osteosperma	10	10	8.44	12.06
B	Opuntia spp.	12	14	.06	.04
B	Pinus edulis	4	5	4.00	6.38
Total for Browse		66	65	16.72	23.27

CANOPY COVER, LINE INTERCEPT --
Management unit 23 , Study no: 3

Species	Percent Cover	
	'98	'03
Artemisia tridentata vaseyana	-	4.26
Juniperus osteosperma	16.79	25.36
Opuntia spp.	-	.03
Pinus edulis	6.00	8.44

KEY BROWSE ANNUAL LEADER GROWTH --
Management unit 23 , Study no: 3

Species	Average leader growth (in)
	'03
Artemisia tridentata vaseyana	1.5

POINT-QUARTER TREE DATA --
Management unit 23 , Study no: 3

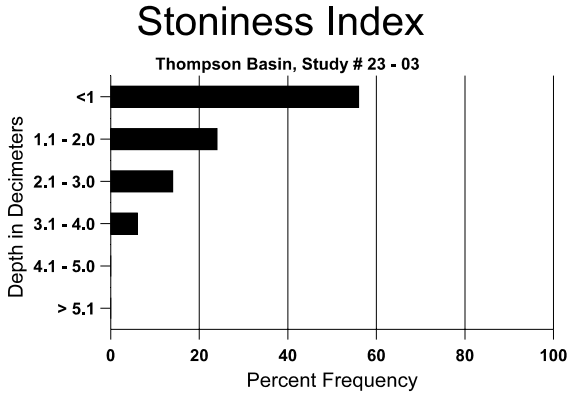
Species	Trees per Acre		Average diameter (in)	
	'98	'03	'98	'03
Juniperus osteosperma	99	97	9.9	8.4
Pinus edulis	72	63	4.2	5.3

BASIC COVER --
Management unit 23 , Study no: 3

Cover Type	Average Cover %			
	'85	'91	'98	'03
Vegetation	2.75	6.00	33.60	29.34
Rock	29.00	24.25	21.23	28.35
Pavement	18.00	14.25	17.47	14.74
Litter	38.00	35.50	42.68	30.02
Cryptogams	1.50	.75	.14	.28
Bare Ground	10.75	19.25	8.38	17.11

SOIL ANALYSIS DATA --
Management unit 23, Study no: 3, Study Name: Thompson Basin

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	ds/m
12.7	74.7 (9.6)	6.6	54.0	19.4	26.6	2.0	10.5	166.4	0.8



PELLET GROUP DATA --
Management unit 23 , Study no: 3

Type	Quadrat Frequency	
	'98	'03
Sheep	2	-
Rabbit	23	21
Elk	4	1
Deer	12	8

Days use per acre (ha)	
'98	'03
-	-
-	-
11 (27)	9 (23)
21 (52)	26 (64)

BROWSE CHARACTERISTICS --
Management unit 23 , Study no: 3

		Age class distribution (plants per acre)					Utilization				
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% poor vigor	Average Height Crown (in)
Artemisia tridentata vaseyana											
85	**1599**	-	133	933	533	-	46	8	33	0	11/21
91	**1466**	-	133	533	800	-	50	18	55	32	14/22
98	**1000**	60	60	640	300	720	14	0	30	10	20/29
03	**1000**	-	100	480	420	280	12	6	42	24	20/28
Cercocarpus montanus											
85	**0**	-	-	-	-	-	0	0	-	0	-/-
91	**0**	-	-	-	-	-	0	0	-	0	-/-
98	**0**	-	-	-	-	-	0	0	-	0	-/-
03	**0**	-	-	-	-	-	0	0	-	0	22/33
Chrysothamnus viscidiflorus stenophyllus											
85	**266**	-	-	133	133	-	25	0	50	0	11/14
91	**266**	-	-	200	66	-	25	0	25	25	11/14
98	**0**	-	-	-	-	-	0	0	0	0	-/-
03	**0**	-	-	-	-	-	0	0	0	0	8/10
Ephedra viridis											
85	**0**	-	-	-	-	-	0	0	-	0	-/-
91	**0**	-	-	-	-	-	0	0	-	0	-/-
98	**0**	-	-	-	-	-	0	0	-	0	12/22
03	**0**	-	-	-	-	-	0	0	-	0	11/9
Gutierrezia sarothrae											
85	**0**	-	-	-	-	-	0	0	0	0	-/-
91	**0**	-	-	-	-	-	0	0	0	0	-/-
98	**0**	-	-	-	-	-	0	0	0	0	-/-
03	**40**	-	-	-	40	-	0	0	100	100	-/-
Juniperus osteosperma											
85	**66**	133	-	66	-	-	0	0	-	0	69/93
91	**199**	-	133	66	-	-	0	0	-	0	118/79
98	**200**	-	100	100	-	40	0	0	-	0	-/-
03	**200**	-	60	140	-	20	0	0	-	10	-/-
Opuntia spp.											
85	**133**	-	-	133	-	-	0	0	0	0	3/2
91	**200**	-	-	200	-	-	0	0	0	0	4/5
98	**320**	20	60	240	20	40	0	0	6	0	5/10
03	**360**	-	60	300	-	-	0	0	0	0	5/11

		Age class distribution (plants per acre)					Utilization				
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% poor vigor	Average Height Crown (in)
Pinus edulis											
85	**66**	-	66	-	-	-	0	0	-	0	-/-
91	**66**	-	66	-	-	-	0	0	-	0	-/-
98	**80**	20	20	60	-	40	0	0	-	0	-/-
03	**100**	-	40	60	-	40	0	0	-	0	-/-